

REMARKS

35 USC §103

Claims 1-3, 8-13 and 19 are rejected under 35 USC §103(a), as being unpatentable over Akino et al. (JP Publication 08-296086) in view of Wong (US 4879007) and Andricacos (US 5516412).

Claims 4-7 are rejected under 35 USC §103(a), as being unpatentable over Akino et al. in view of Wong, Adricacos and Grigger (2859166). These claims have already been canceled. The Applicant is concerned that the Examiner has stopped reviewing this case for new arguments and fresh perspectives, because claims 4-7 were canceled in the last action. The Examiner appears to have developed the arguments in advance of reviewing the last action effectively writing the Final Office Action without considering the last response. The Applicant respectfully requests that the Examiner review this case in full in order to avoid another Request for Continued Examination and contact the undersigned Attorney-of-Record to finally discuss this case. Obviously, this case is important to the Applicants, and therefore, the Applicants respectfully request a teleconference for the third time.

The Applicant respectfully disagrees with the first rejection, since it is the only one that should remain at this point in the prosecution of this application.

Amended Claim 1 recites:

" A plating system comprising:

an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields, wherein each channel is separated by a gap between the upper and lower shields, wherein the gap is less than the height of a part being plated, and wherein the shortest distance from the part being plated to a channel wall is less than the shortest distance between the channel wall and an anode; and

a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels."

Given that this case has been pending for such a long time, it may be wise to take a fresh look at this application, the claims, and the motivation for the inventive and nonobvious subject matter in the current application.

First, it is necessary to point out several key sections of the current specification:

"An improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields farming the sides of the channel)."

And the following from the original specification:

"The system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 — and Applicant's Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the parts to move between the shields; and (5)

incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried."

And finally from the specification for reference:

"It is contemplated that shielding the work piece/cathode of a plating system by moving the work piece within narrow channels formed by the shield **rather than using the shields to shield the anodes by moving the shields closer to the anodes than to the parts being plated results in better distribution of deposited metal on the work pieces.** As such, it is contemplated that the distance D3 between the shields 130 and the anodes 140 be greater than the distance D2 between a part being plated 900 and the shields 130."

Amended claim 1 of the current application states several important features:

1. The plating system has an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields.
2. Each channel is separated by a gap between the upper and lower shields.
3. The gap is **less than** the height of the part to be plated.
4. The shortest distance from the part being plated to a channel **is less than** the shortest distance between the channel wall and an anode.
5. The plating solution horizontal sparger has a series of inlets oriented to direct any plating solution directly into one and toward another of the upper and lower channels.

Let's now review each of the cited references. First, the Examiner cites the Akino reference as a primary reference, as shown above. Akino has design differences

from the current inventive design, and the additional references do not cure the obvious deficiencies.

The Akino reference specifically states that the “Purpose” of the invention is “to prevent the thinning of plating at the upper end of a metallic strip when a current shielding effect and a fluidizing effect are added and to uniformize the plating thickness distribution by forming the lower end of a current shielding plate into an optimum shape.” So, it’s instructive to break this section down to see the components of the Akino electroplating device:

1. A current shielding effect is provided that allows the current to only connect with the cathode or part to be plated.
2. A “fluidizing effect” is added that is basically designed to produce turbulence in the tank.
3. The “fluidizing effect” is formed by two things:
 - a) Use of a “fluid nozzle” to direct a pressurized fluid, such as air into the bottom of the tank; and
 - b) Use of an intentional angular design on the current shields to introduce additional turbulence at the top of the tank after the fluid flows over the part;
4. The gap between the upper shielding plates and lower shielding plates is not smaller than the height of the part to be plated – and this fact is because the upper and lower shielding plates are ***specifically designed to shield current***. Note that the Akino reference states that the current shielding plates are positioned in both the conventional embodiment and the preferred embodiment to regulate plating current. The design difference in Akino that introduces turbulence is the angular point formed into the upper shielding plates.

As stated earlier, the current application discloses the following provisions, and these will be immediately compared with Akino:

Provision	Current Application	Akino Reference
Plating System has an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields	Yes	Yes
Each channel is separated by a gap between the upper and lower shields	Yes	Yes
The gap is less than the height of the part to be plated	Yes – because these shields are not designed to expose the entire side of the part and shield current (see highlighted specification section above)	Absolutely not: <i>the gap between the upper shielding plates and lower shielding plates is not smaller than the height of the part to be plated – and this fact is because the upper and lower shielding plates are specifically designed to shield current.</i>
The shortest distance from the part being plated to a channel is less than the shortest distance between the channel wall and an anode	Yes	No: There is nothing in Akino that teaches or suggests to one of ordinary skill in the art that moving the shields closer to the part to be plated would be beneficial or necessary, based on the physical shape modifications to the shields, primarily <i>because the current application and the Akino reference have different overall functions for the shields.</i>
The plating solution horizontal sparger has a series of inlets oriented to direct any plating solution directly into one and toward another of the upper and lower channels	Yes – the inlets introduce plating solution in a way that leads to turbulence in the chamber.	The Akino reference uses modified shields to introduce turbulence in the plating solution. There is also nothing in Akino to suggest that <u>not physically modifying</u> the shields would work just as well to introduce turbulence.

The Applicants have reviewed the Wong reference, and this reference clearly appears to be cited in hindsight and not because one of ordinary skill of the art would read it and think to combine it with Akino. In Akino – there are upper shielding plates and lower shielding plates that are designed to shield current. Wong does not contain upper shielding plates and lower shielding plates, but merely discloses a trough like shielding device. Second, the Akino device introduces turbulence in the tank by designing an angular design on the end of each of the shields. The "V" design of the trough in Wong is merely so that electrolyte can reach the substrate, but does not impart turbulence. Third, the Akino reference has a fluid nozzle that works to increase the turbulence in the solution. The Wong reference does not disclose this feature.

The Wong device is primarily designed to even out the current flow between the twin anodes, as shown in the Figure. There is absolutely nothing in Wong that would teach that it could (or should) be combined with Akino. Just because the Wong device shows a shielding device that holds the bottom of a substrate in a "V" like trough, does not mean that one of ordinary skill of the art would combine its teachings with Akino to reach the current claims. In addition, the teachings of Wong in combination with Akino do not arrive at the current claims, especially claim 1.

The citation of Andricacos does not appear to be relevant to claim 1 at all, primarily because Andricacos doesn't disclose anything similar to current claim 1 and does not cure the deficiencies of Akino and Wong. There are no upper and lower shields designed to shield current from the part to be plated. The only thing this reference may add is addressing the fluid inlets, but that is no longer a point of contention between the current claims and Akino, because the current claim can be distinguished from Akino by the placement and design of the upper and lower shields. Neither Andricacos or Wong fix this deficiency.

The Federal Circuit has stated that "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." (See *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). The Patent Office applies the same standard. "When the incentive to combine the teachings of the references is not readily

apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (See *Ex parte Skinner*, 2 USPQ2d 1788, 1790 (BPAI 1986). The Federal Circuit crystallizes this concept by the following ruling:

"It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that '[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (See *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczaik*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

"The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight

invalidation of patent claims, the law requires some “teaching, suggestion or reason” to combine cited references...”

When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously.” (McGinley v. Franklin Sports Inc., 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)(citing Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997)).

Failure of the Examiner to provide the necessary suggestion or motivation will create a presumption that the combination of references selected by the Examiner to support the obviousness rejection was based on hindsight. (Irah H. Donner, *Patent Prosecution, Practice & Procedure Before the U.S. Patent Office*, Third Edition) In this case, the Examiner fails to point out how one of ordinary skill in the art would read Wong and/or Andricacos and determine that upper and lower shields are needed. The Examiner cannot possibly point to any part of either of these references and show how one of ordinary skill in the art would use the teachings of Wong or Andricacos, in combination with Akino, and arrive at the current application.

The question remains whether one of ordinary skill in the art would review the Akino reference, along with Wong and Andricacos, and combine them to form the claims of the current application. The Applicant contends that the answer must be no for the following reasons.

First, Akino would seem to suggest modifying the shields to create turbulence in the upper part of the tank – but this modification is one of physical shape and not physical location within the plating tank. There is nothing in Akino that suggests that moving the shields closer to the part to be plated would be beneficial or necessary, based on the physical shape modifications to the shields. There is absolutely nothing in Akino that suggest that one set of shields would be sufficient – and therefore, the one shield configuration of Wong is irrelevant to the question of whether Akino in

combination with another reference reads on the current claims. There is nothing in Andricacos that suggests utilizing a pair of shields.

Second, if one of ordinary skill in the art read the Akino reference, that person would see that in order to introduce turbulence into the tank, one needs to physically modify the shields by tapering or otherwise physically modifying the shields. In addition, one can introduce a fluid nozzle in the bottom of a tank to produce additional turbulence. There is absolutely nothing in Akino to suggest that the upper and lower shields should be moved closer together, so much so that the gap between the upper and lower shields is less than the height of the part to be plated. There is also nothing in Akino to suggest that *not physically modifying* the shields would work just as well to introduce turbulence. In other words, in order for the Akino reference to be meaningful to one of ordinary skill in the art – the shields must be tapered or physically modified to introduce turbulence in the system. There is no single embodiment of the Wong reference or Andricacos that cures any of the defects of the Akino reference, when the Akino reference is used as the primary reference.

Therefore, Akino, alone or in combination with Wong and/or Andricacos, cannot render unpatentable claim 1 of the present application, because one of ordinary skill in the art cannot possibly review the Akino reference on its face alone or in combination with Wong and/or Andricacos and arrive at claim 1. Therefore, the remaining dependent claims are also patentable.

**THIRD RENEWED REQUEST FOR TELECONFERENCE WITH EXAMINER AND EXAMINER'S
SUPERVISOR**

The Applicants have repeatedly and respectfully requested an interview as soon as possible to discuss this case with the Examiner and the Examiner's supervisor, if this case is not in condition for allowance. The undersigned Attorney-of-Record will start calling the Examiner within a week of filing this response to set up an interview to discuss this case.

This case has been pending for a considerable amount of time, and the undersigned attorney-of-record would like to resolve this case as soon as possible. Dr. Thompson can generally be reached any time Monday through Friday from 8AM to 3PM PST at 949-224-6282.

REQUEST FOR ALLOWANCE

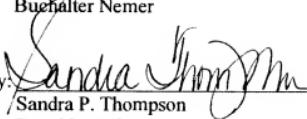
Claims 1-3, 8-13 and 19 are pending in this application and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

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Respectfully submitted,

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